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DESIGN NEW APPARATUS FOR SUTURING BLOOD VESSELS

K. Simonyan

The problem of suturing blood vessels has occupied the attention of surgeons for a long time. N. I. Pirogov wrote that a new era in surgery will begin as soon as it becomes possible to connect blood vessels rapidly and safely without tying them.

The Soviet medical community now notes with great satisfaction that USSR scientists have made a valuable contribution to the problem of the suturing of vessels. A group of engineers and physicians under the direction of Engineer V. F. Gudov has worked for a number of years on the creation of an apparatus which would mechanize completely the fundamental stages of the operation of placing a suture on a blood vessel. Notwithstanding the complexity of the problem, it has now been solved. V. F. Gudov, engineer-designer of the All-Union Institute of Medical Instrumentation and Equipment; N. N. Kapitanov, L. I. Kukushkin, V. U. Polyakov, A. A. Strekopytov, and A. P. Kakab'yan, senior engineer-designers of the same institute; N. P. Petrova, physician-surgeon of the same institute, P. I. Androsov, department chief of the Institute imeni Sklifosovskiy, and M. G. Akhalaya, physician-surgeon of the Second Moscow Medical Institute imeni I. V. Stalin, have been awarded a Stalin Prize of the Second Class for participation in work on the creation of the new apparatus for suturing blood vessels.

Clinical tests have shown that the apparatus solves the problem of suturing blood vessels in urgent surgical operations which cannot be delayed, as well as in other operations where the necessity of forming a connection between the ends of blood vessels may arise. The technique of using the apparatus and of applying the suture was developed by surgeon P. I. Androsov. The establishment of anastomosis between the ends of vessels with the aid of the new apparatus is technically simple and can be accomplished by the average surgeon.

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A short time ago, a patient with a high tourniquet was brought to the Institute imeni Sklifosovskiy. The diagnosis was of a cut wound of the inner surface of the right hip. An examination of the wound disclosed that the blood vessels of the hip were severed. When the major blood vessels are severed, it is practically impossible to restore the connections manually, particularly under wartime conditions, and a complete loss of the injured member frequently occurs. This drawback has been eliminated at present. With the aid of the new apparatus, the injured blood vessels were sutured end to end, and their function restored. The patient was discharged in 13 days.

Until lately, removal of a thrombus and restoration of the circulation in the blood vessel succeeded rarely: a new thrombus formed at the site of the operation. Now the suture applied to the vessel by means of the new apparatus reduces the possibility of thrombosis to a considerable degree.

Aneurisms of blood vessels occasionally form as a result of wounds. Their surgical treatment presents considerable difficulties, especially when suturing of the blood vessel is necessary after removal of the aneurism. The new apparatus simplifies this operation.

The apparatus is particularly important for the suturing of blood vessels in the restoration of the esophagus. The best method for a restoration of this type is use of the small intestine. As a result of the total restoration of the esophagus with the use of the small intestine, the patient acquires a new, well-functioning esophagus within 2-3 weeks. A prerequisite is utilization of the small intestine in such a manner that it can be brought up to the middle of the neck without any danger of subsequent necrosis. Such a utilization of the small intestine is not always possible owing to its insufficient vascular arcade and partial necroses occurring after its displacement. In such cases, restoration of the esophagus is supplemented by insertion of a skin tube, which slows down healing considerably.

To insure additional nutrition of the displaced end of the small intestine, anastomosis is now established between the blood vessels of the displaced intestine's mesenterium and the left inner chest artery [ramus sinister a. pulmonalis?]. This operation was applied in the case of 9 patients threatened with necrosis of the displaced small intestine by reason of its bad blood supply. The results turned out to be excellent.

The apparatus offers wide perspectives for extending the scope of operations on blood vessels. Brilliant surgical technique and audacious pioneering enabled P. I. Androsov to carry out on blood vessels operations which, up to the present, are unique in the world's medical practice. Thus, in cases where for some reason or other the procedure described above is unsuitable, Androsov applies a connection between the right gastroepiploic artery and the lower radial vessel of the used intestine's mesenterium. Five operations carried out by this particular method were successful.

The above-mentioned operations do not exhaust the possibilities of the use of the new apparatus in surgery. Such fields as transplantation of blood vessels and of individual organs will be enriched in the near future as a result of the new achievement.

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